

PATENT CLAIMS

1. Door module for fixing to a door body (9) forming a door base component of a motor vehicle door
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- a frame structure comprising a window frame (10) with guide for a window pane (8)
 - an assembly carrier (4) for holding functional components of the vehicle door on which at least the structural elements of a window lifter holding the window pane (8) are prefitted, and
 - at least one fixing node (2, 3) provided on the frame structure and through which the frame structure can be connected to the door body (9)
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characterised in that

the at least one fixing node (2, 3) has means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) relative to the fixing node (2, 3) substantially transverse to the door plane (xz-plane) in which the assembly carrier (4) extends.

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2. Door module according to claim 1 characterised in that the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) relative to the fixing node (2, 3) substantially transverse to the door plane (xz-plane) are provided on the fixing node (2, 3).

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3. Door module according to claim 1 or 2 characterised in that the fixing node (2, 3) is formed by a separate structural part of the door module (1- 4).

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4. Door module according to one of the preceding claims characterised in that the fixing node (2, 3) is mounted in

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the region of an upper end section (42) of the assembly carrier (4) facing the window opening.

5 5. Door module according to one of the preceding claims characterised in that the fixing node (2, 3) protrudes in the door plane (xz-plane) laterally from the assembly carrier (4).

10 6. Door module according to one of the preceding claims characterised in that the fixing node (2, 3) is formed like a housing for holding the parts of the window frame (10) as well as the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10).

15 7. Door module according to one of the preceding claims characterised in that the fixing node (2, 3) and the assembly carrier (4) form one structural unit relative to which the position of the window frame (10) can be adjusted.

20 8. Door module according to one of the preceding claims characterised in that the window frame (10) is adjustable substantially transversely to the door plane (xz-plane) both in respect of the assembly carrier (4) and in respect
25 of the door body (9).

30 9. Door module according to claim 8 characterised in that the window frame (10) is associated with a front and a rear fixing node (2, 3) in relation to the longitudinal axis of the vehicle, wherein preferably each of the two fixing nodes (2, 3) has means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10).

35 10. Door module according to one of the preceding claims characterised in that the means (6, 21, 22, 31, 32) for

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adjusting the position of the window frame (10) are provided for swivelling the window frame (10) relative to the fixing node (2, 3).

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5 11. Door module according to claim 10 characterised in that the window frame (10) is able to swivel relative to the fixing node (2, 3) about an axis running substantially towards the longitudinal axis (x) of the vehicle.

10 12. Door module according to claim 10 or 11 characterised in that the window frame (10) and the fixing node (2, 3) interact on the ball and socket principle.

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15 13. Door module according to one of the preceding claims characterised in that the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) comprise a wedge (6) which is mounted between the window frame (10) and fixing node (2, 3).

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20 14. Door module according to claim 13 characterised in that the wedge (6) is displaceable in the door plane (xz-plane), more particularly transverse to the longitudinal axis (x) of the vehicle between the fixing node (2, 3) and the window frame (10).

25 15. Door module according to claim 14 characterised in that the wedge (6) is able to swivel in the door plane (xz-plane) between the fixing node (2, 3) and the window frame (10).

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30 16. Door module according to one of the preceding claims characterised in that the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) act independently of the fixing means (63, 64) through which

the window frame (10) is connected to the fixing node (2, 3).

17. Door module according to one of the preceding claims characterised in that the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) can be locked in a defined position through the fixing means (63, 64).

18. Door module according to one of the preceding claims characterised in that the door module (1 - 4) has means (7, 42, 43) for reinforcing the door.

19. Door module according to claim 18 characterised in that the means (7, 42) for reinforcing the door are provided in the breast area (B) of the door.

20. Door module according to claim 18 or 19 characterised in that the means (7, 42) for reinforcing the door comprise a longitudinally extended reinforcement element (7) which extends in the vehicle longitudinal direction (x) and is connected to the or each fixing node (2, 3).

21. Door module according to claim 9 and claim 20 characterised in that the means (7, 42) for reinforcing the door extend between the two fixing nodes (2, 3) and are connected to each of the two fixing nodes (2, 3).

22. Door module according to claim 20 or 21 characterised in that the longitudinally extended reinforcement element (7) is formed tubular at least in the region of the or each fixing node (2, 3).

23. Door module according to one of claims 20 to 22 characterised in that the longitudinally extended

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reinforcement element (7) is supported on the or each fixing node (2, 3).

24. Door module according to one of claims 20 to 23 characterised in that the longitudinally extended reinforcement element (7) is connected with keyed engagement to the or each fixing node (2, 3).

25. Door module according to claim 24 characterised in that the keyed connection is formed by a plug fit connection.

26. Door module according to one of claims 20 to 25 characterised in that the longitudinally extended reinforcement element (7) is additionally connected to the assembly carrier (4), more particularly through a material-bonding connection.

27. Door module according to one of claims 20 to 26 characterised in that the assembly carrier (4) is strengthened and/or profiled in the region of the longitudinally extended reinforcement element (7).

28. Door module according to one of the preceding claims characterised in that function components (51 - 54) of the vehicle door are prefitted on the assembly carrier (4).

29. Door module according to one of the preceding claims characterised in that at least one fixing node (2, 3) has means (23a, 23b, 33a, 33b) for adjusting the position of the fixing node relative to the door body (9) in the vehicle longitudinal direction (x) and/or transverse to the door plane (xz-plane), and these means can interact with corresponding means (97a, 97b, 98a, 98b) of the door body (9).

30. Motor vehicle door having a door body (9) forming a
base component of the door and having a door module (1 -
4) according to one of the preceding claims which can be
5 connected to the door body (9).

31. Motor vehicle door according to claim 30
characterised in that the door module (1 - 4) can be
pushed by at least one section (12, 27) of its frame
10 structure (1) into the door body (9).

32. Motor vehicle door according to claim 30 or 31
characterised in that the position of the door module (1 -
4) can be adjusted relative to the door body (9) in the
15 vehicle longitudinal direction (x) and/or transverse to
the door plane (xz-plane).

33. Motor vehicle door according to claim 32
characterised in that in order to adjust the position of
20 the door module (1 - 4) relative to the door body (9) at
least one bolt (102, 103) is provided which is associated
with an oblong hole (97a, 97b, 98a, 98b) which extends
along the relevant adjusting direction.

34. Motor vehicle door according to claim 32 or 33
characterised in that in order to adjust the position of
the door module (1 - 4) the position of the at least one
fixing node (2, 3) is adjustable relative to the door body
(9).

35. Motor vehicle door according to one of claims 30 to
34 characterised in that the door module (1 - 4) can be
connected to the door body (9) substantially without any
adjustment play perpendicular to the door plane (xz-
35 plane).

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36. Method for assembling a vehicle door according to one of claims 30 to 35 which comprises a door body (9) forming a base component of the door, as well as a door module (1 - 4), wherein the door module (1 - 4) has the following:

- a frame structure which comprises a window frame (10) with a guide for a window pane (8)
- an assembly carrier (4) for holding function components of the vehicle door, on which at least the structural elements of a window lifter holding the window pane (8) are prefitted, and
- at least one fixing node (2, 3) provided on the frame structure and through which the frame structure can be connected to the door body (9)

15 characterised in that prior to connecting the door module (1 - 4) to the door body (9) the position of the window frame (10) is adjusted relative to the fixing node (2, 3) substantially transverse to the door plane (xz-plane) in which the assembly carrier (4) extends.

20 37. Method according to claim 36 characterised in that adjusting the position of the window frame (10) is carried out by swivelling the window frame (10) about an axis (x-axis) lying in the door plane (xz-plane).

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25 38. Method according to claim 36 or 37 characterised in that when fitting together the door module (1 - 4) and door body (9), the position of the door module (1 - 4) relative to the door body (9) is adjusted solely in the door plane (xz-plane).

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30 39. Method according to one of claims 36 to 39 characterised in that when assembling and adjusting the individual door elements (1 - 4, 9, 10) gauges are used by

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means of which / reference points of the individual door
elements (1 - 4, 9, 10) are set in relation to each other.

1. Door module for fixing to a door body (9) forming a door base component of a motor vehicle door

5 with

- a frame structure comprising a window frame (10) with guide for a window pane (8)
- an assembly carrier (4) for holding function components of the vehicle door on which at least the structural elements of a window lifter holding the window pane (8) are prefitted, and
- at least one fixing node (2, 3) provided on the frame structure and through which the frame structure can be connected to the door body (9)

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characterised in that

the at least one fixing node (2, 3) has means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) relative to the fixing node (2, 3) and aggregate support (4) substantially transverse to the door plane (xz-plane) in which the aggregate support (4) extends.

2. Door module according to claim 1 characterised in that the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) relative to the fixing node (2, 3) substantially transverse to the door plane (xz-plane) are provided on the fixing node (2, 3).

PATENT CLAIMS

1. ~~Door module for fixing to a door body (9) forming a~~
door base component of a motor vehicle door
5 with
- a frame structure comprising a window frame (10) with
guide for a window pane (8)
- an assembly carrier (4) for holding functional
10 components of the vehicle door on which at least the
structural elements of a window lifter holding the
window pane (8) are prefitted, and
- at least one fixing node (2, 3) provided on the frame
structure and through which the frame structure can
15 be connected to the door body (9)
characterised in that
the at least one fixing node (2, 3) has means (6, 21, 22,
31, 32) for adjusting the position of the window frame
20 (10) relative to the fixing node (2, 3) substantially
transverse to the door plane (xz-plane) in which the
assembly carrier (4) extends.
2. Door module according to claim 1 characterised in that
25 the means (6, 21, 22, 31, 32) for adjusting the position
of the window frame (10) relative to the fixing node (2,
3) substantially transverse to the door plane (xz-plane)
~~are provided on the fixing node (2, 3).~~
- 30 3. Door module according to claim 1 or 2 characterised in
that the fixing node (2, 3) is formed by a separate
structural part of the door module (1- 4).
4. Door module according to one of the preceding claims
35 characterised in that the fixing node (2, 3) is mounted in

the region of an upper end section (42) of the assembly carrier (4) facing the window opening.

5 5. Door module according to one of the preceding claims characterised in that the fixing node (2, 3) protrudes in the door plane (xz-plane) laterally from the assembly carrier (4).

10 6. Door module according to one of the preceding claims characterised in that the fixing node (2, 3) is formed like a housing for holding the parts of the window frame (10) as well as the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10).

15 7. Door module according to one of the preceding claims characterised in that the fixing node (2, 3) and the assembly carrier (4) form one structural unit relative to which the position of the window frame (10) can be adjusted.

20 8. Door module according to one of the preceding claims characterised in that the window frame (10) is adjustable substantially transversely to the door plane (xz-plane) both in respect of the assembly carrier (4) and in respect
25 of the door body (9).

9. Door module according to claim 8 characterised in that the window frame (10) is associated with a front and a rear fixing node (2, 3) in relation to the longitudinal
30 axis of the vehicle, wherein preferably each of the two fixing nodes (2, 3) has means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10).

10. Door module according to one of the preceding claims
35 characterised in that the means (6, 21, 22, 31 32) for

adjusting the position of the window frame (10) are provided for swivelling the window frame (10) relative to the fixing node (2, 3).

5 11. Door module according to claim 10 characterised in that the window frame (10) is able to swivel relative to the fixing node (2, 3) about an axis running substantially towards the longitudinal axis (x) of the vehicle.

10 12. Door module according to claim 10 or 11 characterised in that the window frame (10) and the fixing node (2, 3) interact on the ball and socket principle.

15 13. Door module according to one of the preceding claims characterised in that the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) comprise a wedge (6) which is mounted between the window frame (10) and fixing node (2, 3).

20 14. Door module according to claim 13 characterised in that the wedge (6) is displaceable in the door plane (xz-plane), more particularly transverse to the longitudinal axis (x) of the vehicle between the fixing node (2, 3) and the window frame (10).

25 15. Door module according to claim 14 characterised in that the wedge (6) is able to swivel in the door plane (xz-plane) between the fixing node (2, 3) and the window frame (10).

30 16. Door module according to one of the preceding claims characterised in that the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) act independently of the fixing means (63, 64) through which

the window frame (10) is connected to the fixing node (2, 3).

17. Door module according to one of the preceding claims characterised in that the means (6, 21, 22, 31, 32) for adjusting the position of the window frame (10) can be locked in a defined position through the fixing means (63, 64).

10 18. Door module according to one of the preceding claims characterised in that the door module (1 - 4) has means (7, 42, 43) for reinforcing the door.

15 19. Door module according to claim 18 characterised in that the means (7, 42) for reinforcing the door are provided in the breast area (B) of the door.

20 20. Door module according to claim 18 or 19 characterised in that the means (7, 42) for reinforcing the door comprise a longitudinally extended reinforcement element (7) which extends in the vehicle longitudinal direction (x) and is connected to the or each fixing node (2, 3).

25 21. Door module according to claim 9 and claim 20 characterised in that the means (7, 42) for reinforcing the door extend between the two fixing nodes (2, 3) and are connected to each of the two fixing nodes (2, 3).

30 22. Door module according to claim 20 or 21 characterised in that the longitudinally extended reinforcement element (7) is formed tubular at least in the region of the or each fixing node (2, 3).

35 23. Door module according to one of claims 20 to 22 characterised in that the longitudinally extended

reinforcement element (7) is supported on the or each fixing node (2, 3).

24. Door module according to one of claims 20 to 23
5 characterised in that the longitudinally extended reinforcement element (7) is connected with keyed engagement to the or each fixing node (2, 3).

25. Door module according to claim 24 characterised in
10 that the keyed connection is formed by a plug fit connection.

26. Door module according to one of claims 20 to 25
15 characterised in that the longitudinally extended reinforcement element (7) is additionally connected to the assembly carrier (4), more particularly through a material-bonding connection.

27. Door module according to one of claims 20 to 26
20 characterised in that the assembly carrier (4) is strengthened and/or profiled in the region of the longitudinally extended reinforcement element (7).

28. Door module according to one of the preceding claims
25 characterised in that function components (51 - 54) of the vehicle door are prefitted on the assembly carrier (4).

29. Door module according to one of the preceding claims
30 characterised in that at least one fixing node (2, 3) has means (23a, 23b, 33a, 33b) for adjusting the position of the fixing node relative to the door body (9) in the vehicle longitudinal direction (x) and/or transverse to the door plane (xz-plane), and these means can interact with corresponding means (97a, 97b, 98a, 98b) of the door
35 body (9).

30. Motor vehicle door having a door body (9) forming a base component of the door and having a door module (1 - 4) according to one of the preceding claims which can be
5 connected to the door body (9).

31. Motor vehicle door according to claim 30 characterised in that the door module (1 - 4) can be pushed by at least one section (12, 27) of its frame
10 structure (1) into the door body (9).

32. Motor vehicle door according to claim 30 or 31 characterised in that the position of the door module (1 - 4) can be adjusted relative to the door body (9) in the
15 vehicle longitudinal direction (x) and/or transverse to the door plane (xz-plane).

33. Motor vehicle door according to claim 32 characterised in that in order to adjust the position of
20 the door module (1 - 4) relative to the door body (9) at least one bolt (102, 103) is provided which is associated with an oblong hole (97a, 97b, 98a, 98b) which extends along the relevant adjusting direction.

25 34. Motor vehicle door according to claim 32 or 33 characterised in that in order to adjust the position of the door module (1 - 4) the position of the at least one fixing node (2, 3) is adjustable relative to the door body (9).

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~~35. Motor vehicle door according to one of claims 30 to 34 characterised in that the door module (1 - 4) can be connected to the door body (9) substantially without any adjustment play perpendicular to the door plane (xz-plane).~~
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35. Motor vehicle door according to one of claims 30 to 34 characterised in that the door module (1 - 4) can be
5 connected to the door body (9) substantially without any adjustment play perpendicular to the door plane (xz-plane).

36. Method for assembling a vehicle door according to one
10 of claims 30 to 35 which comprises a door body (9) forming a base component of the door, as well as a door module (1 - 4), wherein the door module (1 - 4) has the following:

- a frame structure which comprises a window frame (10) with a guide for a window pane (8)
- 15 - an aggregate support (4) for holding function components of the vehicle door, on which at least the structural elements of a window lifter holding the window pane (8) are prefitted, and
- at least one fixing node (2, 3) provided on the frame
20 structure and through which the frame structure can be connected to the door body (9)

characterised in that

25 prior to connecting the door module (1 - 4) to the door body (9) the position of the window frame (10) is adjusted relative to the fixing node (2, 3) and the aggregate support substantially transverse to the door plane (xz-plane) in which the aggregate support (4) extends.

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~~36. Method for assembling a vehicle door according to one of claims 30 to 35 which comprises a door body (9) forming a base component of the door, as well as a door module (1 - 4), wherein the door module (1 - 4) has the following:~~

- ~~- a frame structure which comprises a window frame (10) with a guide for a window pane (8)~~
- ~~- an assembly carrier (4) for holding function components of the vehicle door, on which at least the structural elements of a window lifter holding the window pane (8) are prefitted, and~~
- ~~- at least one fixing node (2, 3) provided on the frame structure and through which the frame structure can be connected to the door body (9)~~

~~characterised in that prior to connecting the door module (1 - 4) to the door body (9) the position of the window frame (10) is adjusted relative to the fixing node (2, 3) substantially transverse to the door plane (xz-plane) in which the assembly carrier (4) extends.~~

37. Method according to claim 36 characterised in that adjusting the position of the window frame (10) is carried out by swivelling the window frame (10) about an axis (x-axis) lying in the door plane (xz-plane).

38. Method according to claim 36 or 37 characterised in that when fitting together the door module (1 - 4) and door body (9) the position of the door module (1 - 4) relative to the door body (9) is adjusted solely in the door plane (xz-plane).

39. Method according to one of claims 36 to 39 characterised in that when assembling and adjusting the individual door elements (1 - 4, 9, 10) gauges are used by

means of which reference points of the individual door elements (1 - 4, 9, 10) are set in relation to each other.

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